

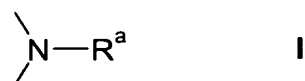
Patent Claims

1. In an electronic device comprising at least one dielectric layer, the improvement wherein said dielectric layer is formed from at least one organic amine derivative, which is capable of forming a crosslinked polymer with itself and/or with at least one multifunctional compound, and/or its crosslinked polymer product obtainable by crosslinking said amine derivative with itself or with at least one multifunctional compound.

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2. A device according to claim 1, wherein said amine derivative comprises two or more identical or different groups of the subformula I

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wherein

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R^a is H, $-\text{[(CR'R'')]}_v\text{-CO}]_r\text{-R}'''$, $-\text{[(CR'R'')]}_v\text{-O}]_r\text{-R}'''$ or $-\text{(CR'R'')}_v\text{-NHZ}$,

20

R' , R'' , R''' are independently of each other H, an alkyl group with 1 to 12 C-atoms or an alkenyl group with 2 to 12 C-atoms, which may be substituted by halogen,

Z is H or a protective group,

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v is 0 or greater or equal to 1, and

r is greater or equal to 1, wherein if v is 0, then r is 1.

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3. A device according to claim 2, wherein v is greater or equal to 1.

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4. A device according to claim 2, wherein said layer is made from one or more amine derivatives comprising two or more groups of the subformula I, wherein at least one of the groups R^a is an alkyl group with 1 to 12 C-atoms or an alkenyl group with 2 to 12 C-atoms, which may be substituted by halogen.

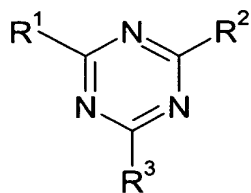
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5. A device according to claim 2 or 3, wherein said layer is made from one or more amine derivatives comprising two or more groups of the subformula I, wherein at least one of the groups R^a is $-[(CR'R'')_v-O-]_r-H$.

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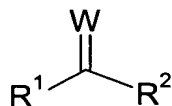
6. A device according to one or more of claims 1 to 4, wherein one or more amine derivatives are selected from formulae I.1 to I.3

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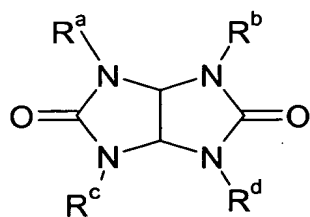
I.1

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I.2

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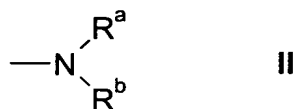
I.3

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wherein

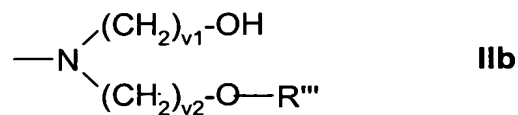
R^1, R^2, R^3 are independently of each other a group of formula II

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- 5 $\text{R}^a, \text{R}^b, \text{R}^c, \text{R}^d$ are independently of each other H, $-\text{[(CR'R'')]}_v\text{-CO]-R}'''$, $-\text{[(CR'R'')]}_v\text{-O-]-R}'''$ or $-(\text{CR'R''})_v\text{-NHZ}$,
- 10 $\text{R}', \text{R}'', \text{R}'''$ are independently of each other H, an alkyl group with 1 to 12 C-atoms or an alkenyl group with 2 to 12 C-atoms, which may be substituted by halogen,
- 15 Z is H or a protective group,
- 15 v is 0 or greater or equal to 1,
- 15 r is greater or equal to 1, wherein if v is 0, then r is 1,
- 20 W is O or S,
- 20 R^3 may, alternatively, be an alkyl, cycloalkyl, aryl or alkylaryl group, which in each case is optionally substituted by halogen.
- 25 7. A device according to claim 6, wherein v is greater than or equal to 1.
- 30 8. A device according to claim 6 or 7, wherein in formulae I.1 to I.3 at least one of the groups $\text{R}^1, \text{R}^2, \text{R}^3$ and/or of the groups $\text{R}^a, \text{R}^b, \text{R}^c, \text{R}^d$ comprises an alkyl group with 1 to 12 C-atoms or an alkenyl group with 2 to 12 C-atoms, which may be substituted by halogen.
- 35 9. A device according to any one of claims 6 to 8, wherein said one or more amine derivatives is selected from formulae I.1 and I.2, and one, two or three of the groups $\text{R}^1, \text{R}^2, \text{R}^3$ are independently of each

other a group of subformula IIb



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wherein

v1 is 0, 1, 2, 3 or 4,

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v2 is 1, 2, 3 or 4,

R''' is H or an alkyl group with 1 to 12 C-atoms, wherein one, more or all H-atoms may be substituted by halogen.

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10. A polymerizable amine mixture comprising

50 to 99.5 % by weight of component A,

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0 to 50 % by weight of component B, and

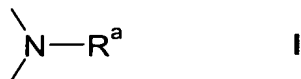
0 to 10 % by weight of component C,

wherein

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A: is at least one organic amine derivative, which is capable of forming a crosslinked polymer with itself and/or with at least one multifunctional compound, wherein the amine derivative comprises two or more identical or different groups of the subformula I

30



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wherein

R^a is H, $-[(CR'R'')_v-CO]_r-R'''$, $-[(CR'R'')_v-O]_r-R'''$ or $-(CR'R'')_v-NHZ$,

5 R' , R'' , R''' are independently of each other H, an alkyl group with 1 to 12 C-atoms or an alkenyl group with 2 to 12 C-atoms, which may be substituted by halogen,

Z is H or a protective group,

10 v is 0 or greater or equal to 1, and

r is greater or equal to 1, wherein when v is 0, then r is 1;

15 B: is at least one multifunctional compound, being capable of reacting with at least one component of A to form a crosslinked polymer; and

20 C: is at least one initiator for the polymerization of the component A or the components A and B.

11. A polymerizable amine mixture according to claim 10, wherein said mixture contains 0.5 to 50 % by weight of component B.
- 25 12. A polymerizable amine mixture according to claim 8 or 9, further comprising component D in an amount of from 0.5 to 50000 % by weight related to the total weight of components A, B and C, wherein component D is a solvent, or a mixture of two or more solvents, capable of dissolving the components A, B and C.
- 30 13. A polymerizable amine mixture according to any one of claims 10 to 12, further comprising superfine ceramic particles as a component F.
- 35 14. A polymerizable amine mixture according to claim 13, wherein the superfine ceramic particles of component F are contained in the

polymerizable amine mixture in an amount of from 0 to 80 % by weight, related to the total weight of components A, B and C.

- 5 15. Polymerizable amine mixture according to one or more of claims 10 to 14, wherein said mixture contains one or more amine derivatives
amine derivative comprises two or more identical or different groups of the subformula I



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wherein

- 15 R^a is H, $-\text{[(CR'R'')}_v\text{-CO]r-R'''}$, $-\text{[(CR'R'')}_v\text{-O]r-R'''}$ or $-\text{(CR'R'')}_v\text{-NHZ}$,

R' , R'' , R''' are independently of each other H, an alkyl group with 1 to 12 C-atoms or an alkenyl group with 2 to 12 C-atoms, which may be substituted by halogen,

20 Z is H or a protective group,

v is 0 or greater or equal to 1, and

25 r is greater or equal to 1, wherein if v is 0, then r is 1.

- 30 16. A polymerizable amine mixture according to one or more of claims 10 to 15, wherein component B is an organic compound with at least two functional groups selected from -OH, -NH₂, -COOH and their reactive derivatives, which functional groups are capable of reacting with at least one component of A to form a crosslinked polymer.

17. An amine polymer material obtainable by polymerization of a polymerizable amine mixture according to at least one of claims 10 to 16.

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18. A process for the manufacture of a dielectric layer of an electronic device comprising the steps
- 5 a) preparing a substrate which optionally comprises one or more layers or patterns of materials with insulating, semiconductive, conductive, electronic and/or photonic functionalities,
- 10 b) forming a thin layer of a polymerizable amine mixture comprising one or more organic amine derivatives as defined in one or more of claims 1 to 7 onto said substrate or onto defined regions of said substrate, and
- 15 c) initiating the polymerization of the polymerizable amine mixture of said thin layer.
19. A process according to claim 18, wherein said polymerizable amine mixture is a polymerizable amine mixture according to one or more of claims 10 to 16.
- 20 20. An electronic device obtainable by the process according to claim 18 or 19.
- 25 21. In an electronic device comprising a dielectric, the improvement wherein said dielectric comprises an amine polymer material according to claim 17.

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